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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/679,773	10/06/2003	Kwang Ho Yoon	DAE-0010	8551
7590	01/19/2006		EXAMINER	
CANTOR COLBURN LLP			NGUYEN, SIMON	
55 Griffin Road South			ART UNIT	PAPER NUMBER
Bloomfield, CT 06002			2685	

DATE MAILED: 01/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/679,773	YOON, KWANG HO
	Examiner	Art Unit
	SIMON D. NGUYEN	2685

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 06 October 2003.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-12 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-12 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 06 October 2003 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____ .
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ .	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____ .

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 1, 6, 9 are rejected under 35 U.S.C. 102(a) as being anticipated by Lee et al. (6,512,408).

Regarding claim 1, Lee discloses a multi-stage mixer (figs.2-3), comprising: an oscillator (multi-phase VCO 100, 110) for generating N clock signals (LO(0), LO(N/2...)), wherein the clock signals having phases sequentially shifted, each including an oscillation signal (LOT+) and an inverted oscillation signal (LOT-); and a mixer (200, 250) for receiving a predetermined RF signal (RF+.RF-), wherein the mixer comprises: a load unit (resistors R1, R2 or R3, R4) including a first load (R1 or R3) connected between a voltage supply (VDD of fig. 2B) and the negative output (OUT-), and a second load (R2 or R4) connected between a voltage supply (VDD) and the positive output (OUT+); an input unit (RF input); and a driving unit (200B, 250B) coupled to the input unit for controlling current signal (I s1,2 of figs. 2B, 3) (column 4 line 22 to column 6 line 27).

Regarding claim 6, Lee further discloses the RF input having a positive source (RF+) and a negative source (RF-) (figs.2A, B).

Regarding claim 9, Lee further discloses the input unit includes first transistor 27 to a positive output terminal, second transistor 28 to a negative output terminal; a third input transistor 25, and fourth transistor 26 as claimed (figs.1, 2A, 2B, 3).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2-5, 7-8, 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (6,512,408) in view of the Applicant's admitted prior art.

Regarding claims 2, 10, Lee further discloses the RF input unit having N stages (200A1, 200A2) (Figs. 2B, 3), and the driving unit having N driving stages (200B1, 200B2), each having a first set of transistors (200B1) responding to the oscillation signals (LOT+), and a second set of transistors (200B2) responding to the inverted oscillation signal (LOT-)) and a first end of the first and second sets of transistors coupled to a source stage and a second end coupled to positive, negative output terminals, respectively.

. It should be noted that Lee discloses in figs.2B, 3, the first set of transistors (220o, 200-2,...220n-2) and the second set of transistors (220n-1,..). Lee fails to teach each driving unit stage having only one transistor responding to the LOT+ signal and

only one transistor responding to the LOT- signal, The Applicant's admitted prior art (fig.1) discloses each driving unit stage having a first transistor responding to the LO+ signal and a second transistor responding to the LO- signal, and a first end of the first and second transistors coupled to a source stage and a second end coupled to positive, negative output terminals, respectively. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to have Lee, modified by the Applicant' admitted prior art to use less transistor in the driving unit which is potentially save space as well to save cost.

Regarding claims 3, 8, and 11, Lee further discloses N is three ((three stages VCO 110-1, 110-2, 110-3 of fig.3, column 5 line 67).

Regarding claim 4, Lee further discloses the source stages each including a transistor having a conducting path between the driving stages (200B1, 200B2) and a ground (Is1, Is2) (figs.2B, 3).

Regarding claims 5, 12, Lee discloses wherein the first set of transistors (200B1, 250B1) is gated by the oscillation signal (LO (0), LO (1)... of LOT+), and has a conduction path between the first load element (R1, R3) and the transistor of corresponding one of the source stages, and the second set of transistors (200B2, 250B2) is gated by the inverted oscillation signal (LO (5), LO (0)... of LOT-) and has a conduction path between the second load element and the transistor of the corresponding one of the source stages (figs. 2B, 3).

Regarding claim 7, this claims is rejected for the same reason as set forth in claim 5, wherein Lee discloses the N positive driving stages (200B1, 250B1) and N negative stages (200B2, 250B2) as claimed (figs. 2B, 3).

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Simon Nguyen whose telephone number is (571) 272-7894. The examiner can normally be reached on Monday-Friday from 7:00 AM to 4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward F. Urban, can be reached on (571) 272-7899.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 306-0377.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

600 Dulany, Alexandria, VA 22314

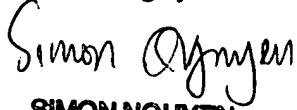
Or faxed to:

(571) 273-8300 (for formal communications intended for entry)

Hand-delivered response should be brought to Customer Service Window located at the Randolph Building, 401 Dulany, Alexandria, VA, 22314.

1/13/06

Simon Nguyen



SIMON NGUYEN
PRIMARY EXAMINER